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EXAMINER

CHEN, KEATH T

ART UNIT

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1792

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/584,340	Applicant(s) OHMI ET AL.	
	Examiner KEATH T. CHEN	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2008.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-22, 28, 29 and 32-35 is/are pending in the application.
 4a) Of the above claim(s) 15-17, 19-22, 28, 29 and 32 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 9-14, 18, and 33-35 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The claim amendment filed on 11/19/2008, addressing claim 9-14 and 18 rejections from the first office action (05/20/2008), by amending claims 9 and 12 and adding new claims 33-35 is acknowledged and will be addressed below.

Election/Restrictions

2. Claims 15-17, 19-22, 28-29, and 32 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group II and Species b-e, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Herchen et al. (US 5819434, hereafter '434).

'434 teaches some limitations of:

Claim 9: A shower plate (Fig. 4, col. 4, lines 52-59) having a plurality of ejection holes (#26s and #28s) adapted to eject a gas, wherein the plurality of rejection holes increases in diameter as going outward of the shower plate (circumferential apertures #28 larger than central aperture #26).

'434 further teaches that the actual arrangement of apertures is considered to be a matter of choice and may be arrived at independently of the section profile imparted (col. 4, lines 57-59).

'434 does not explicitly teaches the limitations of:

Claim 9: each of the plurality of rejection holes increases in diameter as going outward of the shower plate.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have arranged apertures each increasing in diameter as going outward of the shower plate in Fig. 4 of '434, for the motivation to fit a particularly section profile (col. 4, lines 57-59) to promote even distribution of process gas (col. 3, lines 15-18).

4. Claims 10-14, 18, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over '434, in view of Nguyen (US 6565661, hereafter '661).

'434 teaches all limitation of claim 9, as discussed above.

'434 does not teach the limitations of:

Claim 10: A shower plate according to claim 9, wherein a diameter of the ejection hole is changed from the side (#19) where the gas flows into the hole toward the side (#18) where the gas flows out of the hole (col. 6, lines 34-39).

Claim 11: A shower plate according to claim 10, wherein the diameter on the side where the gas flows out of the hole is not less than 0.02 mm and is not more than 10 mm (0.2~2 mm, col. 6, lines 34-35).

'661 is an analogous art in the field of semiconductor manufacturing (abstract) using plasma (col. 5, lines 35-37; similar to '434, see technical field), particularly in showerhead (field of the invention; similar to '434, technical field). '661 teaches a showerhead with a diameter of the ejection hole is changed from the side (#19, Fig. 4) where the gas flows into the hole toward the side (#18) where the gas flows out of the hole (col. 6, lines 34-39) and the diameter on the side where the gas flows out of the hole is not less than 0.02 mm and is not more than 10 mm (0.2~2 mm, col. 6, lines 34-35).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have adopted the showerhead hole design of in Fig. 4 of '661 to the apparatus in Fig. 4 of '434, for the purpose/motivation of providing a high flow conductance showerhead, as taught by '661 (col. 3, line 1) to achieve uniform distribution of precursor (col. 2, lines 65-67).

The above combinations, together, teach some limitations of:

Claim 12: A shower plate ('661, Fig. 4) having a plurality of ejection holes (#18, col. 6, line 26) adapted to eject a gas (precursor, col. 6, lines 39-54), wherein each ejection hole has a portion, on the side (#19) where the gas flows into the hole, having a width which is more than 0.5 mm and is not more than 5 mm (2~15 mm, col. 6, lines 37-38) and a portion, on the side (#18) where the gas flows out of the hole, having a width which is not less than 0.02 mm and is not more than 0.5 mm (0.2~2 mm, col. 6, lines

Art Unit: 1792

34-35), wherein each of the plurality of rejection holes increases in diameter as going outward of the shower plate ('434 teaches, as discussed above, from arranging particular section profile).

Claim 13: A shower plate according to claim 12, wherein said portion (#18) having the width which is not less than 0.02 mm and is not more than 0.5 mm has a length of 0.2 mm to 2 mm (0.5~5 mm, col. 6, line 35).

Claim 14: A shower plate according to claim 13, wherein said shower plate has a thickness of at least 20 mm (T*, col. 6, lines 55-60, being larger than T 3~20 mm, col. 6, line 28).

'434 and '661, together, do not explicitly teach the limitation of the exact ranges:

Claim 12: on the side (#19) where the gas flows into the hole, having a width which is more than 0.5 mm and is not more than 5 mm and on the side (#18) where the gas flows out of the hole, having a width which is not less than 0.02 mm and is not more than 0.5 mm.

Claim 13: a length of 0.2 mm to 2 mm.

Claim 14: a thickness of at least 20 mm.

'661 discloses the claimed invention except for the range of size of the holes and the thickness of shower plate overlap the claimed invention. "In the case where the claimed ranges 'overlap or lie inside ranges disclosed by the prior art' a prima facie case of obviousness exists." See MPEP 2144.05 I.

'434 further teach the limitations of:

Claim 18: A shower plate according to claim 12, wherein the peripheral portion of the surface of said shower plate on the side where the gas flows out is projected over the center portion thereof (as shown in Fig. 3, col. 4, lines 19-28).

For claims 33 and 35, '434 further teaches aperture size is an effect parameter: "that the actually arrangement of apertures in considered to be a matter of choice and may be arrived at independently of the section profile imparted" (col. 4, lines 57-59).

Claims 33 and 35: A shower plate according to claim 9 (or 12), wherein the diameter of said plurality of ejection holes increase in the range of 0.1 to 0.11 mm as going outward of the shower plate.

'434 and '661, together, disclose the claimed invention except for specific diameter size range. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to optimize the hole diameter size range, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

For claim 34, the apparatus is capable of meeting this claim limitations.

Claim 34: A shower plate according to claim 9, wherein each of the plurality of ejection holes is configured in such a way that a diameter of the ejection hole, on the

Art Unit: 1792

side

where the gas flows out of the hole, is twice or less a plasma sheath thickness during an operation (the apparatus is capable of meeting this relationship under appropriate operation condition).

Applicant's claim requirement "each of the plurality of ejection holes ... twice or less a plasma sheath thickness" is considered intended use in the pending apparatus claims because the sheath thickness depends on operating parameters. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (*Walter*, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (*In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02). When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (*In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

Response to Arguments

Art Unit: 1792

5. Applicant's arguments with respect to claims 9-11 and 12-14, see the bottom half of page 5, have been considered but are unconvincing in view of the new ground(s) of rejection.

6. Applicant argument of unexpected result, see the last two lines of page 5 to the top 2 lines of page 6, is not convincing. The uniformity advantage is expected from the prior arts discussed above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEATH T. CHEN whose telephone number is (571)270-1870. The examiner can normally be reached on 6:30AM-3 PM EST.

Art Unit: 1792

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. T. C./
Examiner, Art Unit 1792

/Michael Cleveland/
Supervisory Patent Examiner, Art Unit 1792